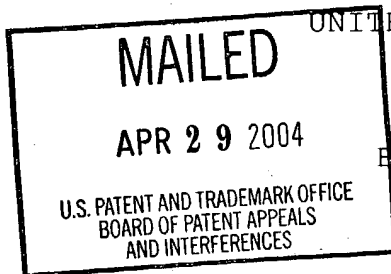


The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.



UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte ROLF WIEDERMANN, STEPHAN WENDEL  
and WOLFGANG SCHMITZ

Appeal No. 2004-0800  
Application No. 08/362,547

ON BRIEF

Before KIMLIN, WARREN and PAWLIKOWSKI, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 3-9.

Claim 9 is illustrative:

9. A process for the production of rigid foams containing urethane groups and predominately isocyanurate groups consisting of reacting:

1) polyisocyanates;

with

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- 2) from 30 to 90 parts by weight of compounds containing at least two isocyanate-reactive hydrogen atoms, having molecular weights of 400 to 10,000, and containing branched chains;

in the presence of

- 3) one or more C<sub>1</sub> to C<sub>6</sub> hydrocarbons as the sole blowing agents;
- 4) from 10 to 60 parts by weight of flameproofing agents; and
- 5) from 10 to 20 parts by weight of compounds containing at least two isocyanate-reactive hydrogen atoms and having molecular weights of 32 to 399 as crosslinking agents;

and, optionally,

- 6) auxiliary agents and additives which are selected from the group consisting of emulsifiers, foam stabilizers, catalysts, reaction retarders, cell regulators, pigments, dyes, stabilizers against ageing and weathering, plasticizers, fungistatic agents, bacteriostatic agents and fillers;

wherein the parts by weight of components (2), (4) and (5) totals 100 parts by weight, and wherein the reaction is conducted at an isocyanate index of 200 to 600.

The examiner relies upon the following reference as evidence of obviousness:

Volkert

5,096,933

Mar. 17, 1992

The present application is related to parent application, U.S. Application No. 08/362,547. An appeal was taken to this Board in the parent application (Appeal No. 1998-3149), and the Board affirmed the examiner's rejection of the appealed claims

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under 35 U.S.C. § 103 over the same reference presently applied by the examiner. The appealed claims are essentially the same as those in the prior appeal with the exception that appealed claim 9 now recites "one or more C<sub>1</sub> to C<sub>6</sub> hydrocarbons as the sole blowing agents," whereas claim 9 of the prior appeal recited "blowing agents consisting essentially of C<sub>1</sub> to C<sub>6</sub> hydrocarbons." The present appeal also includes a Declaration of Wolfgang Friederichs that was not of record in the prior appeal.

Appealed claims 3-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Volkert.

In accordance with the grouping of claims set forth at page 3 of appellants' Brief, claims 4, 5, 7, 8 and 9 stand or fall together, as do claims 3 and 6.

We have thoroughly reviewed each of appellants' arguments for patentability, as well as the declaration evidence relied upon in support thereof. However, we are in complete agreement with the examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the examiner's rejection.

There is no dispute that Volkert, like appellants, discloses a process for producing rigid polyurethane foams which includes

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reacting polyisocyanates with compounds containing at least two isocyanate-reactive hydrogen atoms in the presence of one or more C<sub>1</sub> to C<sub>6</sub> hydrocarbons as the sole blowing agents. Appellants also do not contest the examiner's factual determination that the reaction process of Volkert includes claimed components (4) and (5). Also, while Volkert does not expressly disclose that the reaction is conducted at an isocyanate index of 200 to 600, appellants do not take issue with the examiner's rationale that:

Volkert does set forth ranges of variation and selectivity in choosing the NCO contents for conducting the reactions of their concern, and, further, sets forth that it is well known to the ordinary practitioner in the art that increasing NCO content values leads to increased isocyanurate contents which have the known result of increased flame retardance (see again column 11 lines 32-38), as well as, increases in heat and sag resistance (an additional art known effect).

(Page 4 of Answer, second paragraph). It is appellants' principal contention that "[a]lthough the disclosure of the Volkert reference is broad enough to encompass only cyclopentane as the sole blowing agent . . . none of the working examples of this reference use cyclopentane and/or cyclohexane alone, or any other hydrocarbon having from 1 to 6 carbon atoms!" (sentence bridging pages 4 and 5 of Brief). Appellants urge that Volkert teaches that the blowing agent is preferably used in conjunction with water. However, it is well settled that in determining

obviousness under § 103 a reference must be considered in its entirety, including its non-preferred embodiments. Here, although Volkert prefers that the blowing agents are used in conjunction with water, the reference expressly teaches that cyclopentane or mixtures of cyclopentane and/or cyclohexane can be used alone or in combination with other alkanes. Accordingly, we find that it would have been obvious for one of ordinary skill in the art, based on the Volkert disclosure, to formulate rigid polyurethane foams by utilizing one or more C<sub>1</sub> to C<sub>6</sub> hydrocarbons as the sole blowing agents, as presently claimed.

As for separately argued claims 3 and 6, which recite pentane and hexane, respectively, as the blowing agents, we agree with the examiner that it would have been obvious for one of ordinary skill in the art to formulate a rigid polyurethane foam by reacting the components disclosed by Volkert, and presently claimed, wherein the blowing agent is pentane or hexane or mixtures thereof. While Volkert teaches that saturated hydrocarbons, such as pentane, "possess thermal conductivities which are too high to generate PU rigid foams having the required insulating properties" (column 2, lines 33-35), it would have been obvious for one of ordinary skill in the art to employ

pentane or hexane as the blowing agent in applications where thermal insulation is not a consideration.

Appellants rely upon the Friederichs Declaration to demonstrate that the examples of Volkert which use water as a blowing agent produce a foam having a brittle surface, whereas the elimination of water results in a foam exhibiting strong shrinkage and less dimensional stability. However, appellants have proffered no objective evidence which establishes that the declaration results would have been unexpected to one of ordinary skill in the art. Indeed, it would appear that appellants acknowledge that it was known in the art that water causes surface brittleness. In particular, appellants state that "water is known to cause surface brittleness in foams due to the reaction between the isocyanate and water which results in the elimination of carbon dioxide" (page 5 of Brief, third paragraph). Appellants' specification, at page 1, also indicates that this was known in the art.

Also, significantly, the Declaration does not establish that processes within the broad scope of the appealed claims produce unexpected results. For the reasons set forth in the prior Board decision (see pages 5-6), appellants' specification data, which is not relied upon in the present appeal, falls far short of



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